MARX AND THE DIALECTIC OF ORGANIC/INORGANIC RELATIONS

A Rejoinder to Salleh and Clark

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Our article "The Dialectic of Organic/Inorganic Relations: Marx and the Hegelian Philosophy of Nature" (Foster & Burkett, 2000) appeared in *Organization & Environment* exactly 1 year ago. Our purpose in that article was a very specific one made very clear from the beginning. We were concerned with addressing one of the most persistent and seemingly penetrating criticisms of Marx for his supposed insensitivity to ecological issues, namely, the claim that in referring to nature as "the inorganic body of man" in his *Economic and Philosophic Manuscripts of 1844*, a work otherwise known for its ecological values, he had denied an organic relation between human beings and nature, thus sinning irredeemably against ecology and no less so against dialectics (Marx, 1974, p. 328).

In addressing this question, we naturally singled out some of those thinkers who had emphasized this common criticism in their treatments of Marx. The best known and single most important work along this line was noted social ecologist John Clark's (1989) article in *Environmental Ethics* entitled "Marx's Inorganic Body": a widely cited work that focused centrally (as its title suggested) on the ecological significance of Marx's use of the term *inorganic*. Clark had argued that the "embarrassing fact" about Marx's treatment of the human relationship to nature was that Marx had described nature not as the "organic" but rather as the "inorganic" body of man (p. 244). For Clark, this reference by Marx to "the 'inorganic' quality of 'external' nature signifies its instrumental character in relation to an abstracted humanity, which is taken to be the source of all value" (p. 251). Moreover, not stopping with Clark, we examined the criticisms of other left thinkers who had voiced essentially the same criticism, including Capra (1982), Eckersley, (1992), Lee (1980), O'Neill (1994), Routley (1981), Salleh (1997), and Soper (1996). The first section of our article, following the introduction, was entitled "The Critique of 'Marx's Inorganic Body'" and looked at this fundamental criticism of Marx as voiced by all of these thinkers. The purpose of our article was to address this criticism systematically, through historical and textual research, to determine its validity. Was this criticism of Marx justified in light of the available evidence, or was it not?

In the second section of our article, entitled "The Organic/Inorganic Distinction and Hegel's Philosophy of Nature," we therefore examined how the term *organic* had been used in antiquity and the way the concept had been employed from the

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17th through 19th centuries. In ancient Greece, the term *organic* (or *organon*) had a dual meaning: It was seen as referring both to bodily organs and to instruments. The Greeks, with their natural-born dialectics, saw human tools or instruments as extensions of human organs, reflecting the more universal way in which human beings are able to adapt to their environments. This complex, dialectical notion was later to play an important role not only in Marx's work but also in Darwin's evolutionary theory.

By the 17th century, *organic*, as Carolyn Merchant (1980) has pointed out, had come "to refer to bodily organs, structures and organization of living beings" (pp. xix-xx). *Inorganic*, conversely, came to mean "without organs" or not connected to "bodily organs." Marx's dialectical reference to nature as the inorganic body of man was meant, then, to convey that human beings and nature were connected together, even *bodily* (i.e., in the most intimate way possible, because as Marx, 1974, emphasized, "man is a part of nature" [p. 328]), but that human beings related to nature as extensions of their bodies—through tool making—beyond their own bodily organs (i.e., "inorganically" in this sense). By using the term *inorganic*, Marx was therefore not attempting to divide human beings from nature—to deny what we would today, more loosely, refer to as an "organic relationship"—but merely seeking to define the character and limits of that relationship and the centrality of *tool making* in human evolution as an "inorganic" extension of mere bodily organs. This fundamental distinction, which since the days of Alfred Lotka has been known as the distinction between *endosomatic* instruments and *exosomatic* instruments, is today considered to be one of the most important bases for understanding how human evolution has produced a historical ecological crisis (see Georgescu-Roegen, 1971, pp. 307-308; 1976, p. 25).[1]

We might have stopped our systematic inquiry into Marx's use of *organic* and *inorganic* there, but to do so would have left the matter incomplete because it would have excluded the important role that Hegel played in influencing Marx's understanding in this respect, and some of the more dialectical elements of Marx's conception. We thus analyzed in detail Hegel's (1830/1975) dialectic of organic/inorganic relations, as presented in *The Philosophy of Nature*, and the role that this played in the formation of the perspective that Marx developed in his *Economic and Philosophic Manuscripts* and later works. This was all the more important because none of the critics who had focused on Marx's use of the phrase *inorganic body of man* had related his usage back to Hegel's dialectical treatment of organic-inorganic relations (although the influence of Hegel on Marx is well-known). Hegel had argued that the living being develops and objectifies itself only "against an inorganic nature," which it "assimilates to itself." Organic nature is subdued and "suffers this fate, because it is *virtually* the same as what life is *actually*. Thus in the other the living being coalesces with itself" (Hegel, 1830/1975, p. 281). For Hegel, as for Marx after him, the distinction between organic and inorganic was no absolute barrier, or relation of absolute dominance, but a dialectical relation of interdependence.

After discussing in considerable detail the dialectics of organic/inorganic relations as they appeared in the work of both Hegel and Marx, our article went on to look at how Marx's perspective was modified and deepened through the growth of materialist science in the mid-19th century, particularly under the influence of thinkers like Liebig, Mayer, Hemholtz, Joule, and Darwin, within chemistry, physics, and evolutionary biology. In this context, we explained how Marx's own dialectic of organic/inorganic relations came to be transformed in his later works (given

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the path-breaking scientific developments that these thinkers represented) into a theory of ecological contradiction that took into account the "metabolic rift" between human beings and nature and the need for "restoration" of sustainable ecological relations (on the metabolic rift see also Foster, 1999, 2000). Here, the influence of Liebig was particularly profound. It was in this later argument on the metabolic rift that Marx made his analysis of the alienation of nature—his crucial contribution to the dialectic of organic/inorganic relations—concrete, giving it a historical and scientific foundation.

We concluded the article by reflecting further on the standpoint of those critics who had all too quickly condemned Marx for employing the concept of the inorganic body of man but who had failed to look at the meaning of the phrase in his day or at the complex dialectic of organic/inorganic relations embedded in his thought. Why were these critics so quick to condemn Marx in this respect and so little able to understand the nature of his argument? We argued that this was traceable to certain predispositions of Green theory, such as a primarily ethical and spiritual orientation, a reliance on the dualistic notion of anthropocentrism versus ecocentrism (a new version of the old "man" vs. nature conception), and a teleological conception of nature. There were, we insisted, two general ways of approaching Marx and ecology on the left:

> At issue in the standard critique of organic/inorganic distinctions then are two different and strongly opposed visions of ecological philosophy: one that is materialist, historical, and essentially scientific in character; the other that derives its emphasis from mystical distinctions between anthropocentric and ecocentric and from spiritualistic allusions to nature's teleology. . . . "The conventional antinomies of nature/culture, environment/society, human/nonhuman, and subject/object," Timothy Luke (1999) has written, "all implode in Marx's rendition of these links as one active organic/inorganic project" (p. 44). In Marx's materialist dialectic of organic/inorganic relations, one finds neither a narrowly instrumentalist, anthropocentric perspective nor a flight into mysticism, but rather the core of an ecological critique of capitalist society—a critique that should allow us to translate ecology into revolutionary praxis. (Foster & Burkett, 2000, p. 422).

Having gotten at last to the bottom, we thought, of Marx's usage of the phrase *the inorganic body of man*—an issue that had bedeviled so many earlier thinkers—we welcomed the news that John Clark (2001) and Ariel Salleh (2001) were writing responses to our article. We felt certain that they would be drawn to the persuasiveness of our argument, given our *genetic* account of how these ideas had arisen, how they had been employed, and what it revealed about the ecological connections between thinkers as various as Hegel, Marx, Liebig, and Darwin. Although there would almost certainly be disagreements remaining, given quite different paradigmatic orientations, we thought that socialist ecology would be pushed forward decisively by any exchange that took as its basis the historical discoveries into the development of ecological ideas that we had made.

We were both astonished and disappointed, therefore, to discover that in replying at length to our article, neither Clark (2001) nor Salleh (2001), both of whom had contributed to the criticism of Marx's inorganic body concept, and who had thus helped inspire our inquiries in this area, chose to respond to our central argument. It was as if our argument, together with all of the evidence that we had accumulated to back it up—thousands of words of testimony on one of Marx's most fundamental ecological insights running throughout his works—was invisible.

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Instead, the responses—more than 3,000 words by Salleh and more than 5,000 words by Clark—concentrated not on *the central question of the interpretation of Marx's treatment of organic/inorganic and its ecological-dialectical implications* that had dominated our own analysis but on other issues related to the status of their own contributions to social/socialist ecology, largely divorced from the question of Marx's analysis.

We had addressed Clark and Salleh, first and foremost, as *interpreters of Marx*, and moreover as *interpreters of Marx with respect to one specific question*. We had naturally, therefore, expected a response to this before all else. Were the ecological criticisms leveled at Marx with respect to his use of the concept of the inorganic body of man justified, or were they not, in light of the historical and textual analysis that we had provided?

CLARK'S "MARXES"

Clark's (1989) essay "Marx's Inorganic Body" had claimed again and again, in no uncertain terms, that Marx's so-called Prometheanism was evident in his reference to nature as the inorganic body of human beings.[2] His essay has been widely cited in that regard. We chose this as the central issue of our essay and directly disputed that claim, providing substantial historical and textual evidence. Yet, Clark (2001), in his response, never refers directly to our contravention of his claim at all. Indeed, the closest he comes to acknowledging our main argument, which contested his own earlier contentions, is to say that in criticizing his argument on Marx's use of the *inorganic* (two short quotes from our article are given), we had failed to recognize another statement he had made, in which he quoted Wordsworth's warning about minds that "murder to dissect." Such a point, however, hardly advances the discussion, and we are left in the dark about Clark's view of our central argument, which had contested his own.

To be sure, Clark (2001) now claims that his argument in his 1989 essay on Marx's inorganic body was "rather limited and one-sided" (p. 432) and characterized by "ideological distortions, which [he says] cannot be analyzed adequately in this brief discussion" (p. 441). What he appears to mean by this, judging by the rest of his response to us, is that in his original essay, he had pointed to *two different* "Marxes," whereas he now believes there were "(*at least*) [italics added] three" (p. 432). In his 1989 article, Clark had singled out a "Promethean Marx" (which we will call "Marx I") and an "ecological, radically dialectical Marx" (which we will call "Marx III"). (Marx III, although present in his original article, Clark observes in his response to us, was "underemphasized in part on ideological grounds," p. 433.) Now Clark is prepared to argue that standing all along between the extremes of Marxes I and III (but not evident in his own earlier analysis) there was also another Marx—a "managerial . . . systems-theoretical Marx" (p. 433), which we will call "Marx II". Marx II was "merged" with (or, more accurately, subsumed under) Marx I in Clark's (1989) original essay on Marx's inorganic body. The confusions resulting from the subsumption of Marx II under Marx I and the failure to fully acknowledge Marx III in his 1989 article was a product, Clark (2001) says, of his "sectarian, Bookchinite, anarcho-communist politics" (p. 441), to which he adhered at the time he wrote "Marx's Inorganic Body." (Clark insists that he has renounced his earlier "Bookchinite" views and presently identifies with a certain current within the journal *Capitalism, Nature, Socialism*.) The problem with our work, then, Clark claims, is that it brings out the strengths of Marx II (without dis-

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proving the existence of Marx I) but falls short of the perspective of Marx III, with which he now identifies.

All this strikes us, we must admit, as more than a little odd. We know only one Marx (and one Engels): the Marx who declared that there is really only "one science"—history, with two branches, natural and social (Foster, 2000, p. 226; Marx, 1967, p. 408). For those who seek to avoid any question of unitary (even if genetic) interpretation, it is no doubt convenient to simply say that there are one, two, or three—or perhaps four, five, or six—Marxes. But, that appears to be mere circumlocution. No doubt there was within Marx, as in all thinkers, a certain level of ambiguity and ambivalence. But, to isolate these Marxes one from the other as a set of abstractions divorced from the real thinker, real history, and real struggles is for us mere intellectual game playing, a sort of postmodernist exercise in discursive constructions ad infinitum, with every thinker given over in part to his or her own ghosts. From this standpoint, there is no such thing as a meaningful search for truth in interpretation; whatever one *wants* to say one *can* say about a thinker (and the opposite as well, along with as many variations as one likes in between).

Beyond all this, Clark (2001) finds space in his response to tell us that Marx did not get along with his mother as well as he did with his father (the ecological significance of which is not altogether clear to us). Yet, Clark does not find room to comment on the dispute that we had with his interpretation of Marx on the inorganic body of man. He interprets Marx's (1857/1973) observation in the *Grundrisse* that the worker under capitalism becomes a "watchman and regulator of the production process" as hard evidence of Marx's "Prometheanism" without acknowledging that Marx was (a) simply describing a real process, (b) providing a critique of capitalist alienation of work, and (c) building this on a conception of the capitalist alienation of nature.[3] Clark insists on the need for teleological ethics, a teleological relation to nature, and a teleological interpretation of dialectics without once recognizing that this conflicts not only with his Marx I and Marx II but even with his Marx III. He criticizes us for being insufficiently dialectical and ecological without once acknowledging that we devoted thousands of words in our article to discussing the relation between Hegel and Marx with respect to the "dialectic of organic/inorganic relations." In fact, our entire discussion of Hegel simply never comes up in Clark's response.[4]

Our article, which was principally concerned with dialectically addressing the question of Marx's inorganic body, to use the title of Clark's (1989) original essay, is thus responded to with a series of extraordinary prevarications in which Marx is revealed as having numerous separate existences; or, as Clark (2001) otherwise puts it in the title of his reply, it is not a question of the dialectical conception of nature and society that Marx developed but rather of "Marx's natures," understood as plural (and hence separate) and discursive. For us, in contrast, Marx's work has to be approached as a dialectical whole, not as a set of isolated fragments that can be arbitrarily separated out and opposed to one another. Regrettably, these differences in method between Clark and ourselves tend to shut down the discussion, leaving little hope that we can rationally resolve our differences, or even engage in meaningful debate.

SALLEH AND MATERIALISM

Ariel Salleh (2001) also largely ignores our efforts to explore criticisms of Marx for using the concept of nature as the inorganic body of humanity and our treatment

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of the dialectic of organic/inorganic relations—the whole point of our article. Her approach to these issues is sharply distinguished, however, from Clark's (2001). For example, she says at the outset that our article "provides [a] valuable exposition of Marx's text on the humanity-nature relation" (p. 443). She also concedes that our argument that Marx's use of the concept of nature as inorganic body should not be taken as "denigrating nature" is, as an argument, "fair enough." This is an important acknowledgement on her part, because Salleh had previously employed that criticism of Marx. Yet, she has nothing more to say about our central argument. Her main focus is on our point that the criticisms of Marx's organic/inorganic usage rely generally on arguments that are spiritualist and idealist, as opposed to materialist.

In the context of addressing the question of materialism, Salleh (2001), however, does address an important—but secondary—theme in our article. We had used, for variety, a layered definition of materialism presented by Maurice Mandelbaum (1971, p. 22). (A more sophisticated definition is to be found in Bhaskar, 1983, and is quoted extensively in Foster, 2000.) What Mandelbaum's definition had indicated (and what Bhaskar's definition makes even more explicit) is that materialism of the kind represented by Marx has at least three elements: ontological, epistemological, and practical. Ontologically, Marx took a realist position that nature exists prior to and independently of human consciousness of it. The debate over realism, in this sense, goes back to the roots of Western philosophy in antiquity. Realism can take various forms, including mechanistic materialism/positivism, emergentist materialism, and objective idealism.[5]

In responding to our argument, Salleh (2001) explicitly rejects what she calls "the first position" or a "realist ontology." She argues that "in positing general processes such as thermodynamics or evolution and variable factors such as locality, [the first position] assumes that nature or society can be known directly using a positivist epistemology" (p. 444). Here we differ. Adherence to realism can mean that one has adopted a positivist outlook (e.g., Laplace, Comte, or Durkheim). But, it also can mean that one has adopted an objective idealist position (Plato, Aristotle, Hegel, and Peirce were all realists in this sense). Further, it is consistent with the rejection of mechanistic materialism or positivism (along with idealism) and the adoption of an emergentist/dialectical materialist approach (Epicurus, Feuerbach, Marx, Darwin, and Bhaskar can all be viewed in this way). Within philosophy, realism does not necessarily imply positivism, although positivists normally are realists (see Creaven, 2000; Niniluoto, 1999, pp. 21-41). But, the question of realism remains nonetheless important, and especially so for ecologists. We would argue that it is *impossible to adopt a meaningful ecological perspective without a realist outlook* that suggests that "the world exists independently of [and prior to] human knowing" (p. 444). Materialism, to be worthy of the name (i.e., to be ecological), must extend down this deeply, acknowledging the independent existence of an evolving material world, of nature. Nevertheless, Salleh herself adamantly rejects this "first position."

Rather oddly, Salleh (2001) justifies this rejection on the basis of her adherence to Bhaskar's critical realism. But here, she is mistaken. Bhaskar's work is *critical* realist in that it takes into account the epistemological question as raised most notably in Kant's three critiques (i.e., it does not represent a naive abandonment of epistemology—its reduction to mere mechanical reflection—as in positivism). But, Bhaskar's approach remains critical *realist*. In the tradition of critical materialisms and realism in general, it rejects what Bhaskar (1979, p. 171) termed the "epistemic fallacy" that all philosophy can be reduced to epistemology (ways of knowing), and ontology can thus be rejected. To adopt such an approach would be

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to give in to skepticism of various kinds, Pyrrhonism, Cartesianism, Kantianism, neo-Kantianism, hermeneutics, postmodernism, and so forth. It would also go against one of Bhaskar's primary projects: "the possibility of naturalism," where the split between a positivist science (which rejects epistemology) and a hermeneutic social science (which rejects ontology and embraces subjective idealism/acosmism) can be surmounted.

Although opposing what she calls "the first position," namely, a realist ontology that says that the world exists independently of our knowledge of it, Salleh (2001) introduces a "fourth position." This is the view that "the world does not exist independently of human knowing," which she says "implies an idealist ontology" (p. 444). According to this view, "social life" (and not only social life but also the world as a whole) is "entirely constituted by discursive practices" (p. 444). For this position, Salleh indicates some support, calling it "soft constructionism or 'critical realism' " (p. 444), though it is obviously not critical *realism* at all and is much closer to a hard constructionism.

Salleh (2001) says that she "expects" that we would "agree" with her that the first position (i.e., realism) "is not relevant to our discussion" (p. 444). But on that, we absolutely do not agree, because we consider realism essential to ecology and to (nonpositivistic) science. At the same time, Salleh says that we would "probably agree in rejecting the idealist ontology of the fourth position but disagree on the usefulness of applying its deconstructive technique" (p. 444).[6] She is right that we would strongly reject the acosmism (subjective idealism) embraced by the fourth position.[7] But, we would also argue that this type of idealist outlook is not easily separated from the methodology used within radical constructionist-discursive practices. This is a problem of postmodernism in general.

Like Salleh (2001), we would be willing to embrace a "cautious constructionism" (see the statement on this in Foster, 2000, p. 17), and like Marx and all other philosophers of significance, we would leave room for "critical" knowledge in which the mind plays an active role in our understanding of reality. But, Salleh's approach to constructionism (hermeneutics) appears to us to be anything but cautious or *realist* (critical or otherwise). Although no objective idealist, and indeed a materialist within a limited, practical domain, Salleh seems very much attracted (unabashedly so) to radical constructionism/subjective idealism (i.e., acosmism). But such outlooks, we would argue, reproduce much of the inability to understand the dialectical relation between human beings and nature by privileging once again an abstracted human mind/spirit.

A similar difficulty arises for us from Salleh's (2001) usage of the concept of "the Great Chain of Being" (or Scale of Nature). This concept, which is central to the history and philosophy of science, dates back to antiquity within Aristotle's philosophy and became a central aspect of the medieval Christian theological view. It also governed much of science up through the 17th century. It was subsequently discarded as evolutionary perspectives came to predominate within astronomy, geology, biology, and so forth. (For the classic treatment, see Lovejoy, 1964.) As explained in *Marx's Ecology*:

> The traditional [teleological] concept was that of the "Scale of Nature" or "Chain of Being," which assumed not only that there was a fine scale or gradation of nature, leading up to human beings, but also the immutability of species—all of whom had originally been created separately by God. This scale was essentially static. A common assumption was that human beings, although not much lower than the lowest angels, were actually in the middle of the scale, and that the higher

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> angels were as far above humans as human beings were above the lower organisms. (Foster, 2000, p. 23)

Consistent materialist and evolutionary thinkers such as Marx and Darwin were at war continuously against the Scale of Nature and other teleological conceptions of nature. Idealists such as Hegel almost invariably supported them and rejected transmutation of species. We objected, therefore, to Salleh's (1997) claim that Marx's analysis is "riddled with ontological assumptions derived from the Great Chain of Being" associated with such notions as "God's domination over man, and men's dominion over women, the darker races, children, animals and wilderness" (Salleh, 1997, p. 71). This seems to us to be a misnomer. Marx's analysis, we would argue, is in fact remarkably free from such "ontological assumptions." Domination for him was not due to some Christian-medieval theological conception, idealist ontology (involving teleological notions), essentialist criteria with regard to human nature, and so forth—in fact, Marx, as a consistent materialist, is notable as a lifelong fighter against all such notions. Indeed, any attribution of the concept of the Great Chain of Being to his thought seems extraordinarily misleading.

To be sure, Salleh (2001) in her response to us says that she is not using the phrase as it has long been used in the great conflicts between religion and science, materialism and idealism. Rather, she is using it in the much more general way that has emerged recently in ecofeminist thought to mean an active element—perhaps even *the* active element—of Western culture in Marx's day and in our own; an "ideology inherited from the Judeo-Christian heritage." Recognizing the existence of the Great Chain of Being as a cultural norm and Marx's part in it simply by virtue of the fact that he was a man living in his time helps us, she says, move beyond "Marx's partiality." This type of criticism strikes us as peculiar. It is used as a kind of holistic, portmanteau criticism applicable to each and every thinker (or at least all 19th-century, White, male, European thinkers) without any distinction simply because they belonged to the culture of their time. What they did in rejecting the notions associated with the Great Chain of Being seems to be immaterial. They were products of their time, which was culturally defined above all by this amorphous concept. This is hard to object to because it is difficult to pin down. At the same time, it is hard to see the point, or why such an amorphous criticism should be laid at the door of any particular thinker, especially one so sharply critical of all such teleological-idealist-essentialist conceptions as Marx.

Salleh's (2001) most specific criticism of Marx is that he emphasized a conception of value that privileged men over women, productive labor over reproductive labor, and that his whole value theory was instrumentalist in character, denying the contribution of nature. These are broad misunderstandings. Marx argued that the law of value was specific to capitalism, and in describing how value worked (and what defined productivity under this system), he was describing capitalism. It was not Marx who deemed domestic labor "unproductive" but capitalism, which put no value on it (and never can, at least without distorting and undermining its use value—see Burkett, 1999b; Waring, 1988). Marx himself was a critic of capitalism and saw this for what it was: the denial of wealth-generating activity outside the realm of the market and commodity production. His argument in this respect is clearest in relation to nature, where he said that nature along with labor is one of the two sources of *wealth* (Burkett, 1999a, p. 26; Marx, 1867/1976, p. 134). But, capitalism does not see nature as contributing directly to total *value*, as this is measured under capitalism, but rather treats nature's contribution as a *free good* to the property owner.[8]

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Marx, who wanted the entire wage relation dissolved, was hardly one to privilege wage labor over nonwage labor, nor did he see wage labor as "men's labor." This was not the reality in his time, and his analysis is directed again and again at the exploitation of women as well as men and at specific, egregious forms of the exploitation of women. This is not to say that Marx's analysis was entirely adequate in this respect, only that he did not privilege productive labor over nonproductive labor (as these were defined under capitalism), men's labor over women's labor, labor's contribution to wealth over nature's contribution.

But, did Marx not approach nature primarily "instrumentally," as Salleh says? That depends on what one means by "instrumental." *Labor* for Marx was another term for the metabolic transformation of the human relation to nature, using instruments derived from nature. In that sense, he was "instrumentalist," as we all are. But, Marx insisted on the need for a sustainable human relation to nature and provided a critique of the alienation of nature. In that sense, he adopted a position that was a far cry from what would normally be called an instrumentalist view of nature. How one views these things, though, depends on how one stands. For deep ecologists, human beings are inherently instrumentalist, though we can strive, they also say, to be suprahuman—to "think like a mountain" and perhaps live like a mountain. With respect to such purely sentimentalist conceptions of nature, which denied the human laboring condition, Marx was a ruthless critic.

Are there things left out of Marx's materialist approach to nature that need to be developed to create a more adequate ecological materialism? Yes, of course, and they are many. Ariel Salleh's own work, we would argue, has helped fill some of these gaps and represents in its broadest contours an important contribution. Salleh (2001) complains that in our article on Marx's dialectic of organic/inorganic relations, we ignored the most important aspects of her work, simply emphasizing her interpretation of Marx. But, the interpretation of Marx was what our article was about. Elsewhere, we have separately highlighted the path-breaking nature of Salleh's work. One of us (Burkett) has written a (forthcoming) review of *Ecofeminism as Politics* (Salleh, 1997) for a major publication, affirming the extraordinary importance of her work. The other (Foster, 2000, p. 254) has pointed to the critical importance of the concept of "embodied nature" as developed by Salleh and others. Disagreements remain. But, none of this erases the fact that in our view, a developed dialectic of organic/inorganic relations is essential, even though it would ultimately have to include the new ecological materialist emphasis on the body that Salleh has so importantly advanced.

NOTES

1. Although we did not discuss the use of these concepts that Georgescu-Roegen (1971, 1976) took from Lotka in our original article, the theoretical distinction between *endosomatic* and *exosomatic* instruments is exactly the same one as made by the ancient Greeks and employed in the 19th century by thinkers such as Marx and Darwin, using the terminology of *organic* and *inorganic* and of *natural technology* and *human technology*. Moreover, it constitutes an essential element in the contemporary ecological critique of capitalist society.

2. Clark (2001, p. 433) says that we "do little if anything to exorcise the Promethean Marx" in our article. This is because such a critique goes beyond the boundaries of what we were addressing in that article and because we have both provided extensive critiques of this interpretation (including Clark's views) in our previous work (see especially Burkett, 1999a, pp. 147-173; Foster, 1999; Foster, 2000, pp. 126-140).

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3. In our article, we made the error (for which we adamantly apologize) of saying that Clark in his 1989 article showed no firsthand knowledge of Marx's *Capital* and took his citations from the excerpts provided by Howard Parsons (1977) in his useful *Marx and Engels on Ecology*. This was a mistake on our part and was ungenerous to boot. The error will be corrected if our article is ever reprinted. Clark did demonstrate in his original article firsthand knowledge of Marx's *Capital, Vol. 1* (Marx, 1867/1976) and also some knowledge of *Capital, Vol. 3* (Marx, 1894/1981). However, there is no sign in his work of a detailed assessment of Marx's ecological writings such as might have been undertaken prior to writing his critique. For example, there is virtually no reference to the hundreds of pages that Marx devoted in *Capital, Vol. 3* (Marx, 1894/1981, pp. 751-950) to agriculture, including its ecological contradictions. Clark (2001) himself has admirably acknowledged the shortcomings in his earlier reading of Marx in this respect. Hence, he quite generously thanks Paul Burkett for his

> exhaustive documentation [in Burkett, 1999a] of passages in which Marx discusses topics such as soil conservation and pollution. I am grateful to him for his careful scholarship and for correcting a shortcoming in my analysis and in that of many others. (p. 434)

We consider this to be an important and very gracious admission, clearing the way for the kind of close examination of Marx's work in this respect, and its relation to other ecological contributions of his time (and subsequently), that we think is very much needed.

4. Besides ignoring our discussion of dialectic (while criticizing us for being insufficiently dialectical), Clark (2001) also neglects to discuss our treatment of materialism, even in the section of his response entitled "The Historical Struggle Between Materialism and Teleology."

5. In referring here and in subsequent passages to "emergentism," we are referring to what became the central concept in the resurrection of both realist philosophy and nonreductive philosophical materialism in the late 20th century. This idea, which has become a central notion of scientific as well as philosophical realism, focuses on the evolutionary development of "integrative levels" within nature (and society)—levels that have arisen from, but are nevertheless irreducible to, those that preceded them. The significance of this analysis lies in its rejection of both mechanical materialism, with its reductionist hypotheses, and the teleological views characteristic of idealism. The most influential modern exponent of emergentism within the realist philosophical tradition in the early to mid-20th century was C. Lloyd Morgan (1926), but this form of analysis has also been advanced by Marxists and critical realists such as Joseph Needham (1938) and Roy Bhaskar (1993). For a general history of the concept, see David Blitz (1992).

6. Salleh's (2001) skepticism and ambivalence on the question of ontology can be seen in the fact that she explicitly rejects both "the first position," that is, realism (the notion that the world *exists* independently of our knowledge of it) *and* "the fourth position," which she calls an "idealist ontology" (the notion that the world *does not exist* independently of our knowledge of it).

7. *Acosmism* in philosophy refers to the position that denies the independent existence of a material world or cosmos. It is especially characteristic of subjective idealists such as Berkeley.

8. For Marx's ecological value analysis, see Burkett (1999a, pp. 69-106 and throughout his book, and 1999b). For a discussion of Marx, women, and capitalism, see Chattopadhyay (1999).

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